Indiana State Museum
Forces of Nature IMAX Film Education Accompaniment

This educator resource is a self-led activity guide that will enhance, highlight and expand the subjects covered in the IMAX film *Forces of Nature*. Your class will visit the museum's Birth of the Earth, Ancient Seas, and The Age of Ice galleries, as well as the Naturalist's Lab. Throughout these galleries students will stop at several interactive activities that will demonstrate how forces of nature have affected Indiana.

Indiana Academic Standards have been provided for each gallery and activity.

Birth of the Earth

This gallery traces the history of the early earth and state from a geological perspective. It shows how constant, slow change - interrupted by sudden bold transformations - created the Indiana we know today.
Indiana Science Standards: 3.3.5, 3.6.5, 6.3.7, 7.3.7
Indiana Social Studies Standards: 7.3.7, 8.3.4

1. **It's About Time**
   Stop at the Geologic Time Tower and get a perspective of how long 4.6 billion years really is. Forces of nature can cause changes in a matter of seconds or over billions of years.
   Indiana Science Standards: 3.6.5, 6.7.2

2. **Looking at Layers**
   Explore this partial model of the Earth. Encourage students to read the panel and touch the different layers on the globe. How do you think these layers interact with each other?
   Indiana Science Standards: 3.6.3, 6.3.7, 7.7.2, 8.3.2

3. **Earthquake: Finding the Fault**
   Learn what a seismograph is and encourage students to jump on the circle to imitate an earthquake.
   Indiana Science Standards: 6.3.22, 6.7.2, 7.3.7, 8.3.4

4. **Omni Globe**
   Stop at the large globe and listen to the narration explaining plate movement of the earth's tectonic plates. How far has Indiana moved over time?
   Indiana Science Standards: 3.3.5, 5.3.7, 5.3.12, 6.7.2, 7.3.7, 8.3.3
   Indiana Social Studies Standards: 7.3.7, 8.3.4

5. **Ready To Rock! Creating Earth's Building Blocks**
   Examine the process of the rock cycle and how it forms the three basic types of rocks: sedimentary, metamorphic, and igneous. Can you follow the pattern of the rock cycle?
   Indiana Science Standards: 4.3.6, 4.3.7, 5.3.8, 6.7.2, 7.3.4, 7.3.9
   Indiana Social Studies Standards: 7.3.7, 8.3.4

R. B. Annis Naturalist's Lab

This unique, hands-on lab gives visitors a chance to explore Indiana's natural history and wildlife. Numerous activities let visitors touch natural items, listen and imitate animal calls, take a fossil quiz, and explore seismic activity with a comprehensive computer interactive.
Indiana Science Standards: 3.4.5, 6.3.22, 7.3.7

6. **Analyze Indiana Station**
   Explore two computer programs related to Earth's seismic activity. View how seismic waves travel through the Earth's different layers. Study different parts of the world and determine where risk zones and hot spots occur. Compare the number of earthquakes in the New Madrid fault zone to the number in Japan.
   Indiana Science Standards: 6.3.22, 6.7.2, 7.3.4, 7.3.7, 7.7.2, 8.3.4

Ancient Seas

Indiana was once covered by a shallow ocean. About 100 million years ago, the plate carrying North America (and Indiana) reached its current position. Many of the ancient life forms that once inhabited the area have since vanished, but Indiana's rocks hold their history. In this gallery students can view the museum's diverse fossil collections, helping them explore the ancient life that shaped the state. See how this ancient life has provided Indiana with natural resources like coal, oil and natural gas. At the end of this gallery learn about Indiana's "Missing Record," 300 million years of rock record lost to erosion but punctuated by a glimpse of life uncovered by the museum's paleontology department.
Indiana Science Standards: 4.3.5, 4.3.14, 5.4.8
Indiana Social Studies Standards: 6.3.12, 7.3.7

7. **Changing the Face of Earth**
   Spin the dial and watch a time lapse of how the Earth's landscape has changed over millions of years. Why do you think Indiana is missing a portion of its geological past?
   Indiana Science Standards: 3.3.5, 4.3.5, 6.7.2, 7.3.7
   Indiana Social Studies Standards: 7.3.7, 8.3.4

The Age of Ice

Hundreds of feet thick and enormously heavy, glaciers created lakes, changed habitats and in general gave Indiana a makeover. As the climate changed during the Ice Age, so did plant and animal populations. About 11,000 years ago, many large mammals such as mastodonts and mammoths began to disappear from North America and a new mammal arrived - humans. This gallery gives visitors a chance to see bones and fossils from the large animals that inhabited Indiana at this time, and to glimpse into the forces that helped shape the Indiana we know today.
Indiana Science Standards: 4.3.5, 7.3.7
Indiana Social Studies Standards: 4.3.6

8. **Welcome to the Ice Age! The Cycle of Freeze and Thaw**
   Stop at the area with the large boulders in the Age of Ice gallery. How were these large boulders transported into Indiana?
   Indiana Science Standards: 4.3.5, 7.3.7
   Indiana Social Studies Standards: 4.3.6, 7.3.7, 8.3.4

For more information about other Indiana organizations or sites that have information on these topics, please use the Hoosier Heritage Trail features throughout the galleries.